

Pinal County Planning Model
Socioeconomic Estimates and Forecasts

final
report

prepared for



Arizona Department of Transportation

prepared by

Cambridge Systematics, Inc.

draft report

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Table of Contents

1.0 Methodology	1-1
1.1 Methodology.....	1-1
1.2 Data Sources.....	1-4
1.3 National and Regional Trends	1-5
2.0 Base Year Estimates.....	2-1
2.1 Pinal County Population.....	2-1
2.2 Pinal County Dwelling Units	2-6
2.3 Pinal County Employment	2-7
2.4 Maricopa County Population and Employment	2-7
2.5 Summary of Base Year (2004) Estimates	2-7
3.0 Future Year Forecasts	3-1
3.1 Pinal County Population Projections	3-2
3.2 Pinal County Dwelling Unit Projections.....	3-3
3.3 Pinal County Employment Projections.....	3-4
3.4 Maricopa County – Population and Employment	3-11
3.5 Summary of Future Year (2030) Projections.....	3-11

List of Tables

1.1	Pinal Corridor Planning Model Socioeconomic Parameters	1-2
1.2	Historic and Estimated Population Growth Rates	1-7
2.1	BFS Population Estimates by Study Area.....	2-2
2.2	Zone Adjustments for Prison Population.....	2-6
3.1	Percent of Total Employment by Study Area	3-6
3.2	PCPM Projected Employment by Study Area	3-7
3.3	Employment Estimates, 2004 and 2030.....	3-8
3.4	PCPM Employment by Land Use Category.....	3-10
3.5	Employment by Land Use Category and Study Area	3-11

List of Figures

1.1	Overlap of Bond Feasibility Study Areas and PCPM Traffic Analysis Zones	1-4
1.2	PCPM Zones Organized by BFS Study Areas.....	1-5
1.3	Population Growth Trends and Potential Projections.....	1-6
2.1	Comparison of Pinal County Population Estimates, 2004	2-2
2.2	Apache Junction Composite Approach	2-3
2.2	PCPM 2004 Population Estimates by Zone	2-8
2.3	PCPM 2004 Total Employment Estimates by Zone.....	2-8
3.1	Pinal County Comprehensive Plan Land Use Map	3-1
3.2	Comparison of Pinal County Population Projections, 2030.....	3-2
3.3	Projected Population Growth in Pinal County	3-3
3.4	Population-Employment Ratio, Maricopa and Pinal Counties	3-5
3.5	PCPM 2030 Population Projections by Zone.....	3-12
3.6	PCPM 2030 Employment Projections by Zone	3-12

1.0 Methodology

This report describes the development of base and future socioeconomic estimates for the Pinal Corridor Planning Model (PCPM), developed by ADOT to support the evaluation of potential new highway corridors in Northern Pinal County. This section presents a summary of the methodology, data sources used, and historical trends in population and employment growth. The following two sections present the base and future year methods and resulting estimates of population and employment.

■ 1.1 Methodology

Population, dwelling unit, and employment estimates were developed for input directly into the PCPM. These data were formatted using the PCPM zone structure (390 total zones in Pinal and Maricopa Counties). The estimates were based on data from three existing regional modeling systems:

- The 2003 Southeast Maricopa/Northern Pinal County Transportation Study (SEMNPTS) model that extended the Maricopa Association of Governments (MAG) model into Pinal County;
- The Pinal County model developed for the 2000 Pinal County Transportation Plan; and
- The Apache Junction model developed for the 2003 Apache Junction Small Area Transportation Study.

In addition, two sources of control data were used:

- The 2004 Arizona Department of Economic Security (ADES) estimates of city and county population; and
- The 2004 Bond Feasibility Study (BFS) developed by Applied Economics for the Central Arizona College.

The variables collected for entry into the PCPM model are shown in Table 1.1.

Table 1.1 Pinal Corridor Planning Model Socioeconomic Parameters

Parameter	Description/Examples
<i>Population</i>	
Population	Total population, excluding prisoners
Dwelling units	Total dwelling units
<i>Employment (Land Use Categories)</i>	
Retail	Convenience stores, big box retailers, car dealers, shopping malls, strip commercial
Office	Business parks, office buildings
General	Manufacturing, extraction/processing of raw materials, warehousing
Government	Courts, state and county complexes, city offices, water treatment facilities
Other	Not identified elsewhere. Includes hospitals, churches, airports, etc.

Source: Cambridge Systematics, Inc., 2005.

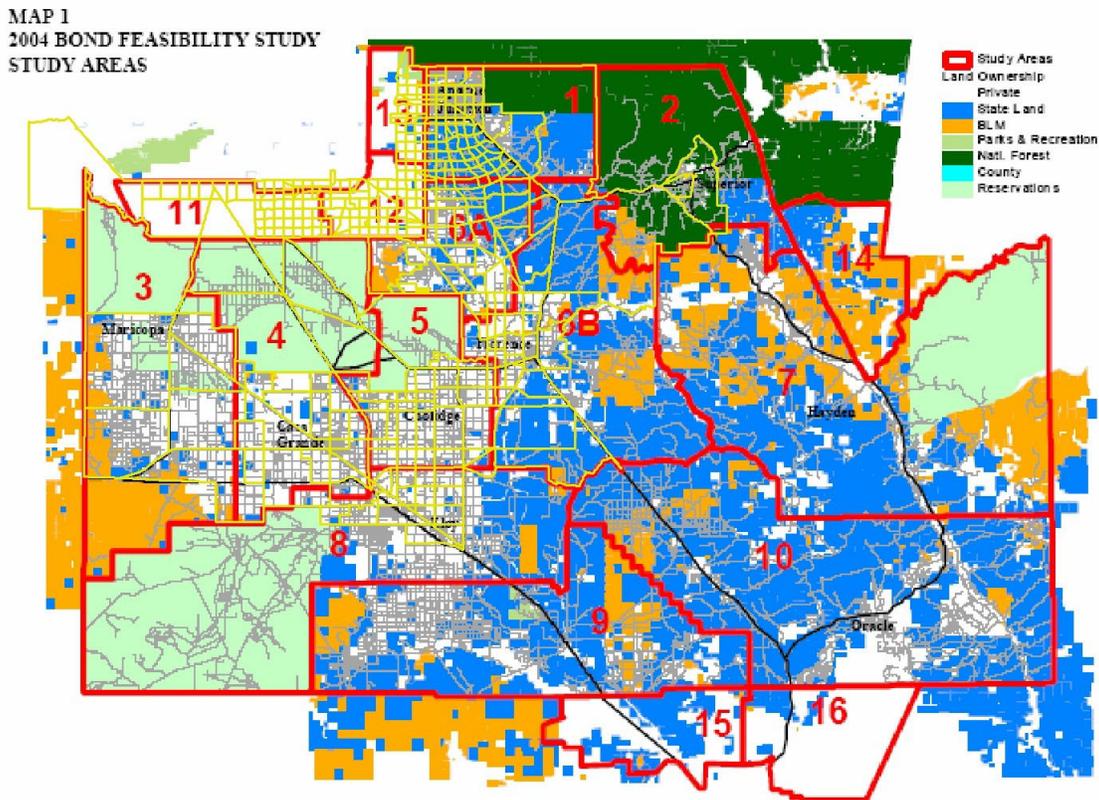
The basic steps for developing estimates of population and employment were as follows.

1. **Develop a common base year for all existing data.** Each of the three modeling databases were brought to a common base year of 2004 using a linear interpolation between the base and forecast years of the particular modeling system.
2. **Develop a common future year for all existing data.** Each of the three modeling databases were brought to a common future year of 2030 using a linear extrapolation of the future year using the annual rate of change between base and forecast years of the particular modeling system.
3. **Develop a consistent zone structure for all existing data.** The zone structure used for the PCPM is a combination of the zone structures from the Apache Junction and SEMNPTS models. In addition, some zones were split to enable the model to account for expected future growth in Pinal County. Using Geographic Information Systems (GIS), each zone structure was spliced and merged to conform to the common zone structure. Following standard practice, population and employment within each zone were assumed to be uniformly distributed over the entire area of a zone.
4. **Implement controls for land use.** Much of the study area for the Pinal Corridor Definition Studies is currently in control of state or Federal agencies, or is Indian Reservation lands. In particular, a significant portion of the study area is State Trust Land controlled by the Arizona State Lands Department (ASLD). Though much of this land may be developed in the future, it is important to implement constraints on socioeconomic estimates for 2004 that take into account the current lack of development on this land. The most recent GIS file of land ownership from the Arizona Land Resource Information System (ALRIS) was compared to the estimates of population

and employment derived from the three modeling systems. Currently held state lands were assumed to have no population or employment growth to 2004. Federally protected lands, such as National Forests, were assumed to have no population and limited employment for both 2004 and 2030.

5. **Comparison with population control totals.** ADES provides official estimates and projections of population for Arizona’s cities and counties. The 2004 estimates were compared against the modeling systems. Notably, the model zones do not match up with city boundaries, so it is impossible to have an exact comparison between ADES and the modeling systems. The ADES data do provide some general control totals at the city and county level that are useful for estimating current population. The other source used for control totals was the Central Arizona College BFS, developed to assess the future need for facilities and program offerings. Completed in 2004, the BFS includes current estimates and future projections of population for much of Pinal County and a small portion of Maricopa County. This study provided population estimates and projections for 16 aggregate areas, 11 of which overlap with or completely contain zones from the PCPM. The BFS study areas are organized around particular cities. Figure 1.1 provides a map demonstrating the overlay between the BFS study areas and the PCPM zones. The comparison between the BFS and ADES control totals and previous modeling efforts is described in more detail below.
6. **Finalizing population totals.** A zone-by-zone check within the PCPM was conducted to ensure the reasonableness of socioeconomic estimates for both base and future years. Population densities were compared against the local road system (e.g., does the base year data show development where there is no infrastructure to support it?) and land use (as described above). In addition, zonal data were compared to prison data in Pinal County to ensure that large numbers of prisoners are not included in the population estimates.
7. **Finalizing dwelling unit totals.** Dwelling units were assumed to grow at the same rate as population for a particular zone (i.e., population per dwelling unit was held constant for a particular zone).
8. **Finalizing employment totals.** Based on historical estimates and land use plans, employment growth is expected to be slower than population growth in Pinal County. Pinal County has relatively few established employment centers. For base year data, employment for most zones was estimated from SEMNPTS model data. For future year data, assumptions were developed regarding the relationship between types of employment (e.g., retail, office, etc.) and population. These are discussed in detail in Section 3.1 below.

Figure 1.1 Overlap of Bond Feasibility Study Areas and PCPM Traffic Analysis Zones

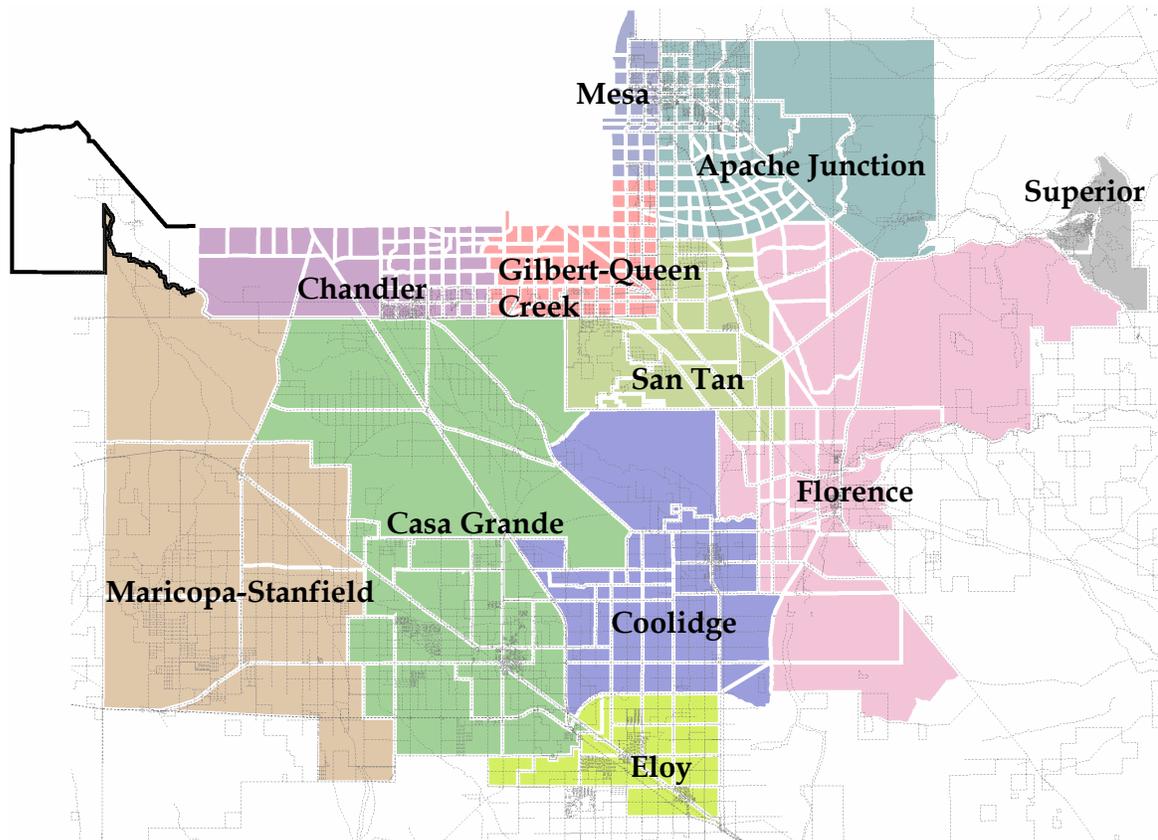


Source: Central Arizona College Bond Feasibility Study and Cambridge Systematics, Inc.

■ 1.2 Data Sources

As described above, five sources of population data and three sources of employment data were used to estimate socioeconomic data for the base year. All of the three regional modeling systems (SEMNPIS, Pinal County, and Apache Junction) provided data for population and employment. The area totals from the BFS and ADES only included population estimates, and were used to develop control total guidelines in our analysis. Figure 1.2 illustrates the approximation of the BFS study areas by the PCPM zones. Though the BFS study areas do not line-up perfectly with the PCPM zone boundaries, there is significant overlap. Most areas that do not overlap are large zones that are currently held by public agencies (such as State Land). In addition, one large zone in Maricopa County does not fall within any of BFS study areas.

Figure 1.2 PCPM Zones Organized by BFS Study Areas



Source: Cambridge Systematics, Inc., 2005.

■ 1.3 National and Regional Trends

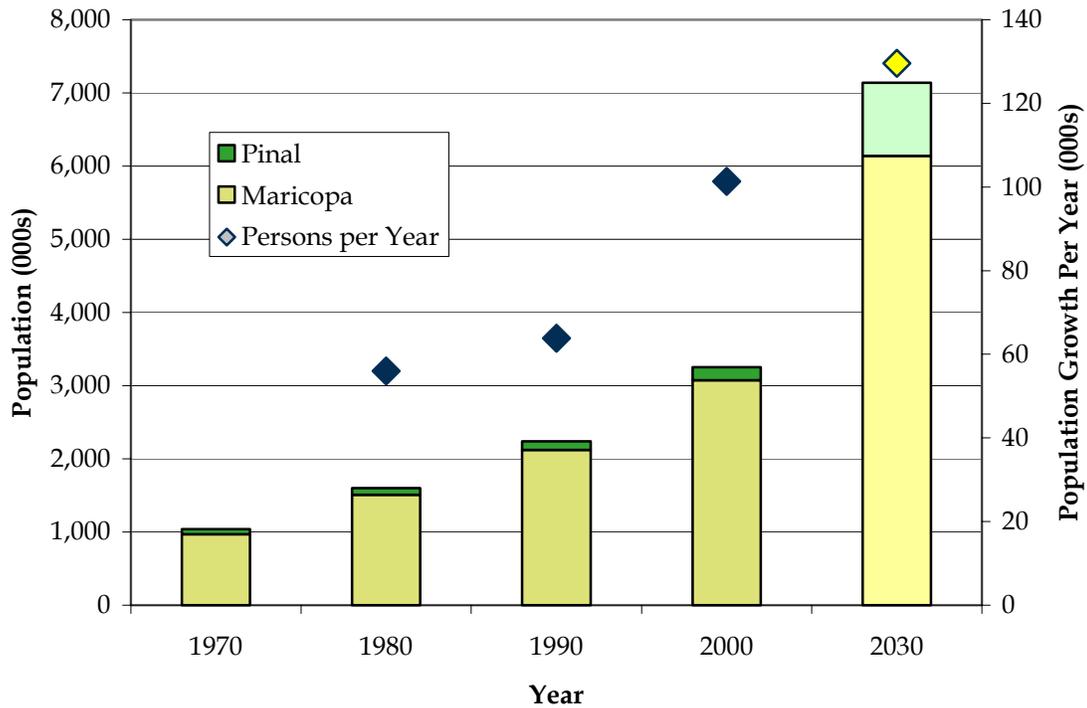
It is important to understand future growth in the study area within a national and regional context. Northern Pinal County is becoming increasingly linked to the Phoenix metropolitan area. This section presents historical information on population and employment that provides this context.

Maricopa County has grown from 1 million to 3 million people between 1970 and 2000. According to projections from MAG, the County will grow by an additional 3 million by 2030. Pinal County has grown only minimally between 1970 and 2000, but is expected to grow much faster over the next 30 years.

Figure 1.3 presents historical population growth for Maricopa and Pinal Counties. It also presents two potential future scenarios for Pinal County (set arbitrarily at 1 million and 2 million additional people by 2030). Finally, it shows the number of people moving into

Maricopa and Pinal Counties each year, both historically and given the two growth scenarios for Pinal County.

Figure 1.3 Population Growth Trends and Potential Projections



Source: U.S. Bureau of the Census, 2002; and Cambridge Systematics, Inc., 2005.

The number of people moving into Maricopa and Pinal Counties has increased substantially over the last 30 years, from roughly 60,000 per year between 1970 and 1990 to over 100,000 per year between 1990 and 2000. To maintain pace with MAG’s projections and 1 million additional people in Pinal County by 2030 would mean more than 130,000 people would move into the region every year through 2030. These are well above historical growth rates for the Phoenix metropolitan area. Table 1.2 presents a comparison of historic and projected growth for Pinal County to the rapidly growing areas of Maricopa County and Las Vegas.

Table 1.2 Historic and Estimated Population Growth Rates

	Historic (1970-2000)	Projected (2000-2030)
Annual Population Growth		
Pinal County	3,705	30,609
Maricopa County	70,031	102,262
Las Vegas	38,420	37,589
Annual Growth Rate		
Pinal County	3.3%	6.2%
Maricopa County	3.9%	2.3%
Las Vegas	5.6%	2.0%

2.0 Base Year Estimates

This section presents the assumptions and methods used to develop base year socioeconomic estimates for the PCPM in support of the Pinal County Corridor definition studies. As shown above, the sources for the forecasts come from the existing travel demand models (SEMNPPTS, Pinal County, and Apache Junction) and the BFS.

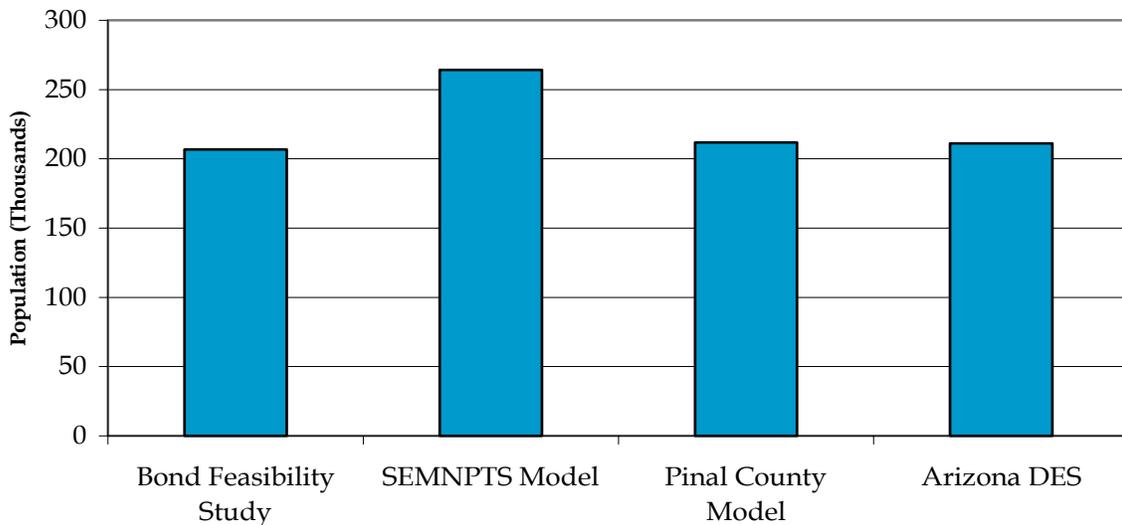
■ 2.1 Pinal County Population

In Pinal County, the BFS study areas are generally larger than the cities they are named to represent. As a result, the ADES population estimates for the incorporated cities in these areas are expected to be smaller than the estimates for the BFS study areas. In addition, not all of the BFS study areas overlap perfectly with the PCPM zones. In particular, the PCPM zones only cover a portion of the BFS study areas for Florence and Eloy. Finally, the estimates for the travel demand models are based on a linear interpolation of population between the base and future year data of those modeling systems. Because the rate of growth in much of Pinal County is expected to increase over time, some areas will likely not have grown as much by 2004 as the linear interpolation would suggest. For example, the Apache Junction area, which includes substantial State Trust Lands, is expected to develop when those lands are released.

Figure 2.1 provides a summary of the total population estimates for 2004 for the sources identified above in Section 1.0. Overall, the four data sources used produce relatively consistent estimates of current population. The SEMNPPTS data are somewhat higher, but this is likely a function of the linear extrapolation method used to generate 2004 data.

Table 2.1 provides a summary of the BFS population estimates by study area. Each of the studies used somewhat different definitions of study areas, making a direct comparison between the estimates impossible at the study area level. The remainder of this section describes how the methods were applied to estimate population and employment for the PCPM zones. This analysis is organized by BFS study areas, which provide control totals for many of the PCPM zones.

Figure 2.1 Comparison of Pinal County Population Estimates, 2004



Source: Central Arizona College, 2004; Southeastern Maricopa County/Northern Pinal County Transportation Study, 2003; Pinal County, 2000; Apache Junction, 2003; and Cambridge Systematics, Inc., 2005.

Table 2.1 BFS Population Estimates by Study Area

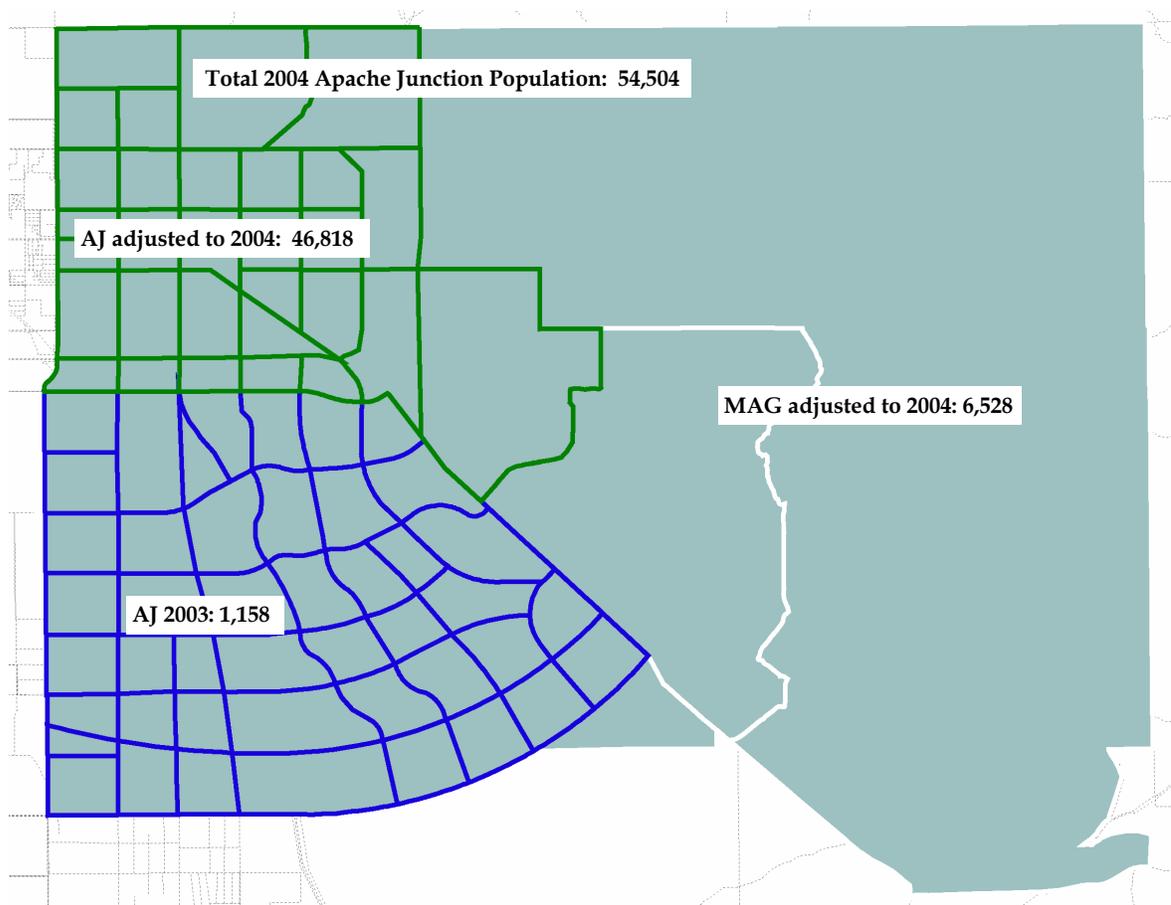
BFS Study Area		Population
1	Apache Junction	56,695
2	Superior	4,652
3	Maricopa-Stanfield	20,693
4	Casa Grande	52,486
5	Coolidge	14,933
6A	San Tan	18,663
6B	Florence	21,184
8	Eloy	17,497
Pinal County Total		206,803

Source: Central Arizona College, 2004

Apache Junction

Apache Junction was the only BFS study area in the PCPM where all sources provided a consistent zonal boundary with overlapping population estimates. This zonal area includes the City of Apache Junction, the community of Gold Canyon, some developments outside the Apache Junction city limits, and substantial tracts of undeveloped State Trust Lands. For the purposes of estimating base year population, the Apache Junction was divided into the following three subareas as shown in Figure 2.2:

Figure 2.2 Apache Junction Composite Approach



Source: Cambridge Systematics, Inc., 2005.

1. **Northwest** - The core of the currently developed Apache Junction, north of Baseline Road and U.S. 60.
2. **Southwest** - The area of the Apache Junction study area that is almost exclusively state lands to the west of U.S. 60.

3. **East** – Two zones that are east of Apache Junction and U.S. 60. For these two zones, existing model estimates were available only from the SEMNPTS and Apache Junction models. These two zones include substantial land area controlled by the U.S. Forest Service, as well as State Lands.

PCPM zones in the northwest portion of the Apache Junction study area from the Apache Junction model were used to estimate current year population and employment estimates. The Apache Junction model was completed in 2003, making these the most current data available for this subarea. Discussions with Apache Junction planning staff revealed that no major new developments have been approved within the boundaries of Apache Junction since the completion of this model. The total 2004 population for PCPM zones in this subarea is nearly 47,000.

For PCPM zones in the southwest subarea, unadjusted data from the Apache Junction model were used to estimate current year population and employment. This subarea is almost entirely composed of undeveloped State Trust Lands. In 2003, the population estimated for this area in the Apache Junction model was under 2,000. The unadjusted SEMNPTS model estimates for this area are somewhat higher, at just over 4,000. Given the lack of development in this region, the lower number is most appropriate for use. Within this study area, any zones that were completely under the control of the State Lands Department were assumed to have zero population and employment in the base year.

The PCPM zones in the eastern subarea of Apache Junction were based on SEMNPTS modeling data for current year population and employment estimates. The Pinal County estimates for this area were one-fifth as large as SEMNPTS. Using the SEMNPTS estimates for this subarea brings the total population estimate for the Apache Junction study area to 55,504, which is very close to the BFS control totals (56,695) for this study area.

City of Maricopa

The City of Maricopa, which was incorporated in 2003, is currently engaged in a Small Area Transportation Study (SATS) that will address the future growth and the local transportation system. The distinction between new and existing communities will be more important when examining population growth in the context of each Pinal County Corridor Definition Study.

ADES estimates that the City of Maricopa has a current population of just under 5,000 (as of July 2004). Current population growth in this community is rapid, with an additional 15,000 people expected by 2005. The City of Maricopa SATS, currently under development, estimates that roughly 10,000 people were living within the city limits in December 2004. The 2000 Census estimates an additional 6,346 people living in unincorporated areas and on Indian Reservations in the Maricopa BFS study area. The remainder of the BFS study area includes the Ak-Chin Indian Reservation, the small unincorporated community of Stanfield, and substantial private land outside of any community. Given these factors, a total population of 16,346 was assumed for 2004 for PCPM zones within this study area.

This population was distributed using the available information about the location of development within the study area.

San Tan

The San Tan study area is expected to experience rapid population growth in the future. The BFS estimates that the area will quadruple between 2000 and 2005. However, it is assumed that the growth is probably non-linear for this area, increasing as development continues over the next 30 years. Recent information about the proposed City of San Tan suggests that, if it incorporates, it will have a base year (likely 2005) population of roughly 20,000. Given the current disposition of this land, the BFS study area total of just under 19,000 was used as a control total for the PCPM zones in this subarea. This control total was distributed to individual zones using the population estimates contained within the SEMNPTS model.

Casa Grande and Coolidge

Casa Grande and Coolidge are better established communities that continue to expect growth. ADES estimates current year population of 31,000 for Casa Grande and 8,000 for Coolidge. These estimates are for the unincorporated portions of these communities, which are smaller than the study area boundaries identified above. The BFS estimates that an additional 25,000 people live in unincorporated areas in these two study areas. For the PCPM, these BFS population totals were used and distributed to zones using the SEMNPTS model.

Florence

According to ADES, Florence had roughly 17,000 people in 2004. This is relatively consistent with the estimate from the BFS of 21,000 residents, especially including unincorporated areas within the BFS study area. However, Pinal County has several large prisons in the Florence study area. Both the BFS study and ADES include prisoners in their estimates. According to the Arizona Department of Corrections, there were approximately 8,000 prisoners within the Florence study area (see Table 2.2). For the PCPM, these prisoners were subtracted from the total population estimate for this area to ensure that the prisoners do not generate trips in the model. The prison itself, in particular the employment at the prison, does generate trips, but not nearly at the level of a housing development of equal size.

Table 2.2 Zone Adjustments for Prison Population

PCPM Zone	BFS Study Area	Prison	Prison Population	Adjusted Zone Population
275	Florence	Eyman	4,384	2,611
	Florence	Florence West (private)	739	
280	Florence	Florence	3,466	1,809

Source: Arizona Department of Corrections and Cambridge Systematics, Inc., 2005.

Eloy

The PCPM zone structure includes only a portion of the City of Eloy, primarily north of Interstate 10. In the 2000 Census, population in the northern portion of the Eloy BFS study area was roughly two-thirds of the total of the Eloy and Pichacho-Red Rock BFS study areas. These two study areas had a combined population of 19,642 in the BFS study. For the portion of this study area covered by the PCPM, a control total of 12,957 (two-thirds of the total population in the two BFS study areas) was distributed to PCPM zones using the SEMNPTS model.

Superior

Superior includes two PCPM zones that are partially overlapped by the BFS study area. Superior is wedged between National Forest Service lands, limiting the potential for population and employment growth in this area. ADES estimates that just over 3,000 people live within this area. For these two PCPM zones, the ADES data was used to estimate population.

■ 2.2 Pinal County Dwelling Units

Dwelling units were estimated based on the SEMNPTS ratio between population and dwelling units for each zone in the PCPM. These ratios were multiplied by the population estimated for each zone, as described above, to generate total dwelling units by zone.

■ 2.3 Pinal County Employment

The BFS does not provide control totals that can be used to estimate employment. Overall Pinal County control totals are available from Woods & Poole, however. The following steps were used to estimate employment:

- A control total was generated for all PCPM zones within Pinal County. Woods & Poole identifies the total employment for Pinal County at 57,060 jobs in 2004. Using the ratio between Pinal County employment (from Woods & Poole) and PCPM employment (from SEMNPTS) for 2000, a total of 48,571 jobs were estimated to be within the PCPM zones in Pinal County in 2004.
- Employment data for zones within the Apache Junction study area were replaced with data from the Apache Junction travel demand model. These data were grown from 2003 to 2004 conditions using the County employment growth rate of 2.3 percent.
- The remainder of employment in Pinal County was distributed to zones using the estimates of employment by zone in the SEMNPTS travel demand model.

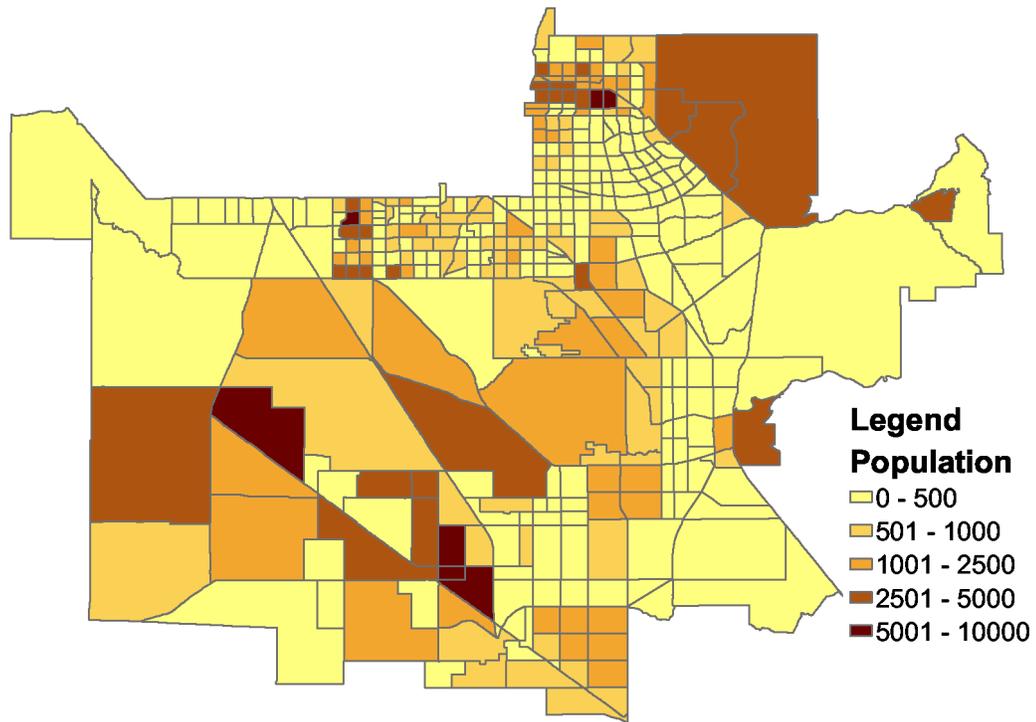
■ 2.4 Maricopa County Population and Employment

Three of the BFS study areas are within Maricopa County – Mesa, Gilbert-Queen Creek, and Chandler. The BFS used data from the MAG model to develop population estimates for these three study areas. As the MAG model provides the only data available for these areas, the PCPM used MAG model data for both population and employment projections for zones in these study areas.

■ 2.5 Summary of Base Year (2004) Estimates

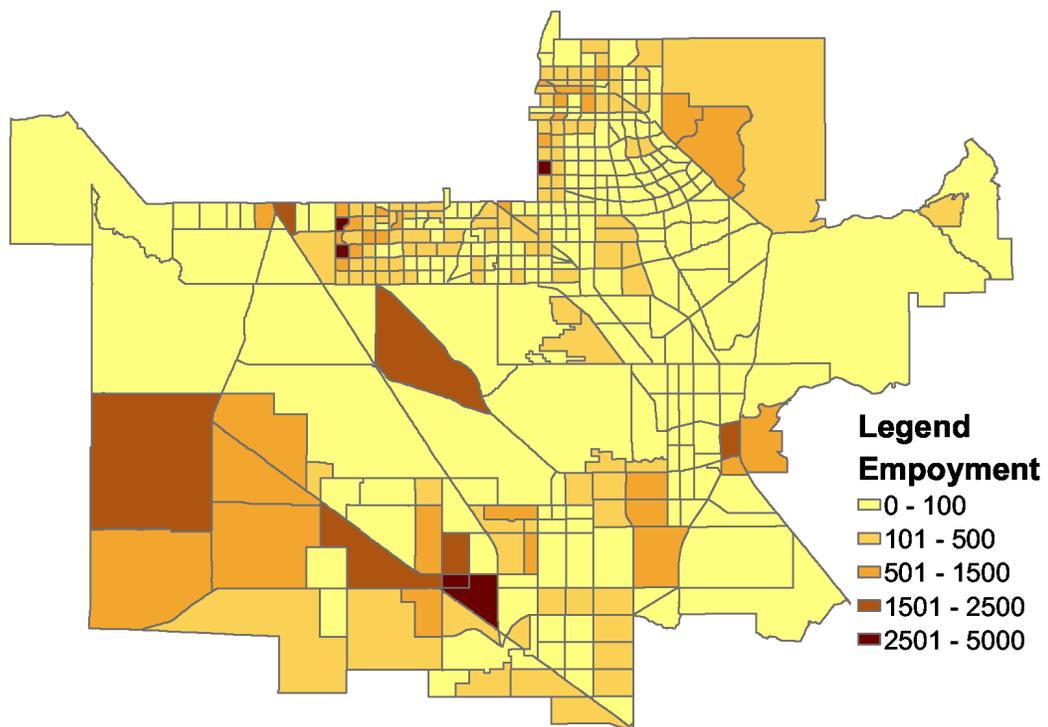
Final population estimates for 2004 are shown in Figure 2.2, and final total employment estimates are shown in Figure 2.3. Tables with zonal-level estimates of population and employment are attached in Appendix A.

Figure 2.2 PCPM 2004 Population Estimates by Zone



Source: Cambridge Systematics, Inc., 2005.

Figure 2.3 PCPM 2004 Total Employment Estimates by Zone

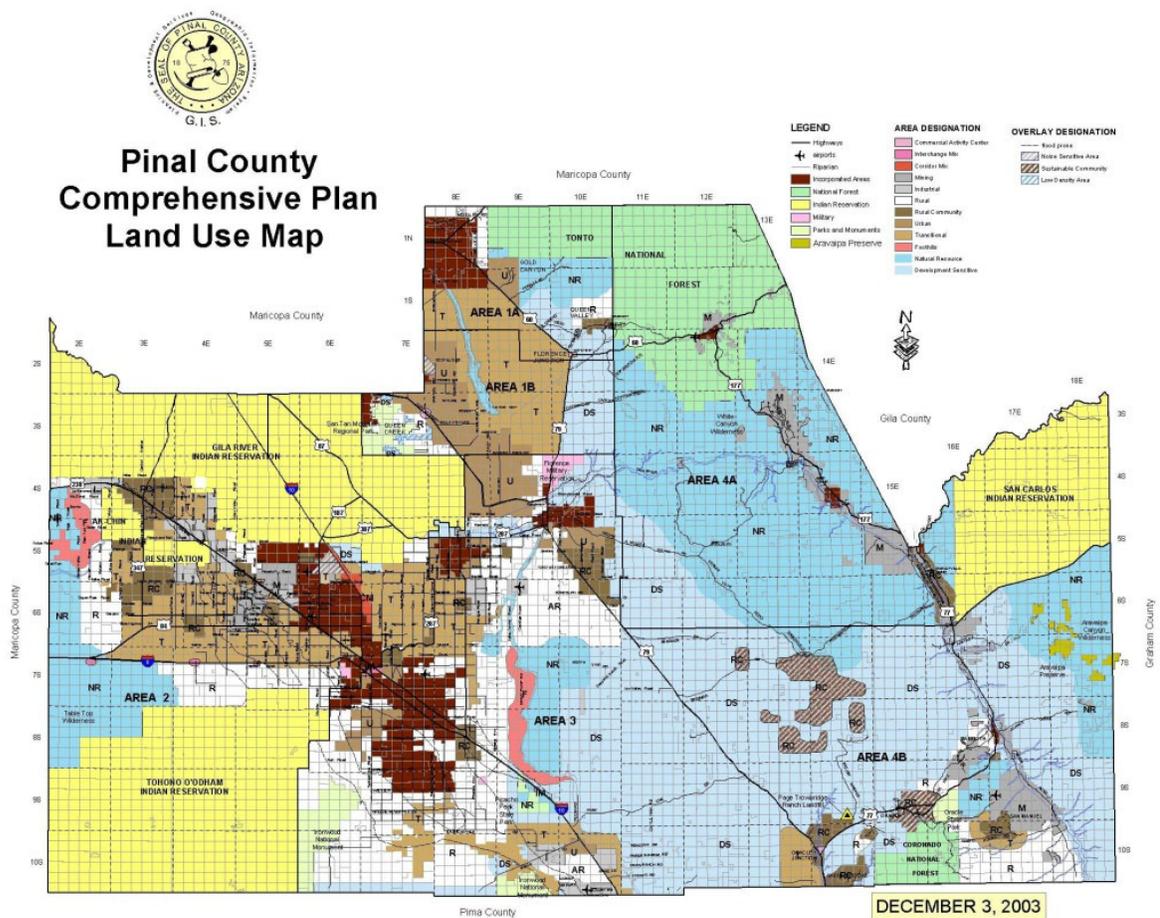


Source: Cambridge Systematics, Inc., 2005.

3.0 Future Year Forecasts

This section presents the assumptions and methods used to develop future year socioeconomic forecasts for the PCPM in support of the Pinal County Corridor definition studies. As shown above, the sources for the forecasts come from the existing travel demand models (SEMNPST, Pinal County, and Apache Junction) and the BFS. In addition, the Pinal County land use plan served as an additional point of reference to estimate the extent of future year development (see Figure 3.1). Information from the land use plan was used to help estimate potential development in unincorporated areas.

Figure 3.1 Pinal County Comprehensive Plan Land Use Map



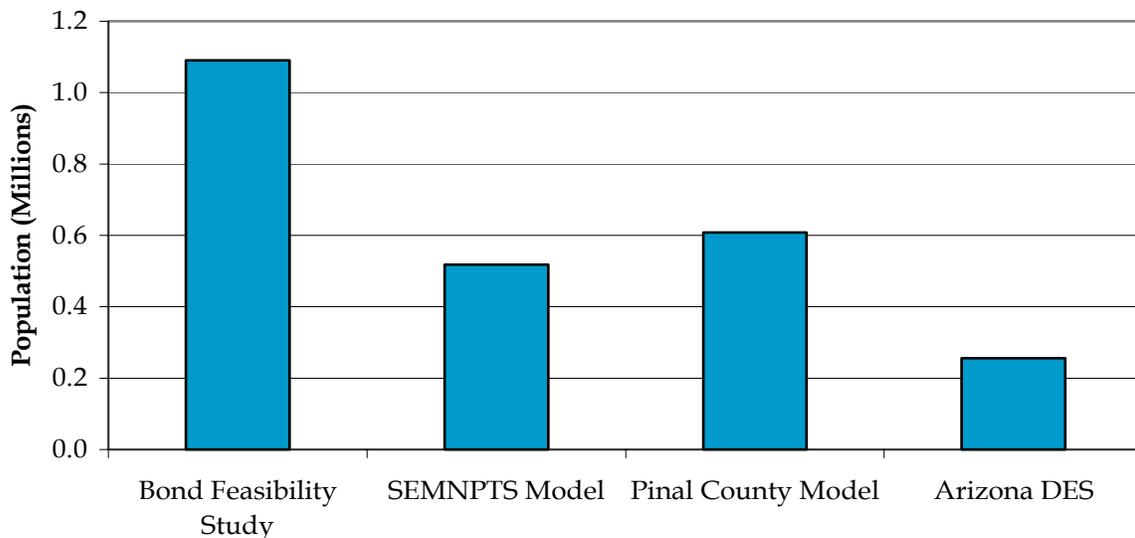
Source: Pinal County, 2003.

The remainder of this section provides estimates of population and employment for the PCPM.

■ 3.1 Pinal County Population Projections

Figure 3.2 provides a summary of the population projections for Pinal County from the sources identified above. These comparisons are shown for the entire model area used by the PCPM. Except for the Arizona Department of Economic Security (ADES) numbers, the comparisons are for the same geographic area. The ADES projections are the lowest, but are for the largest area, covering all of Pinal County. The other data sources are for the model area only, which does not include some smaller communities in the southern part of Pinal County. Each of the other studies has developed subregional population projections that are reasonably consistent across the three studies. Because each of the studies used a different definition of these subregions, the direct comparisons are not reproduced here.

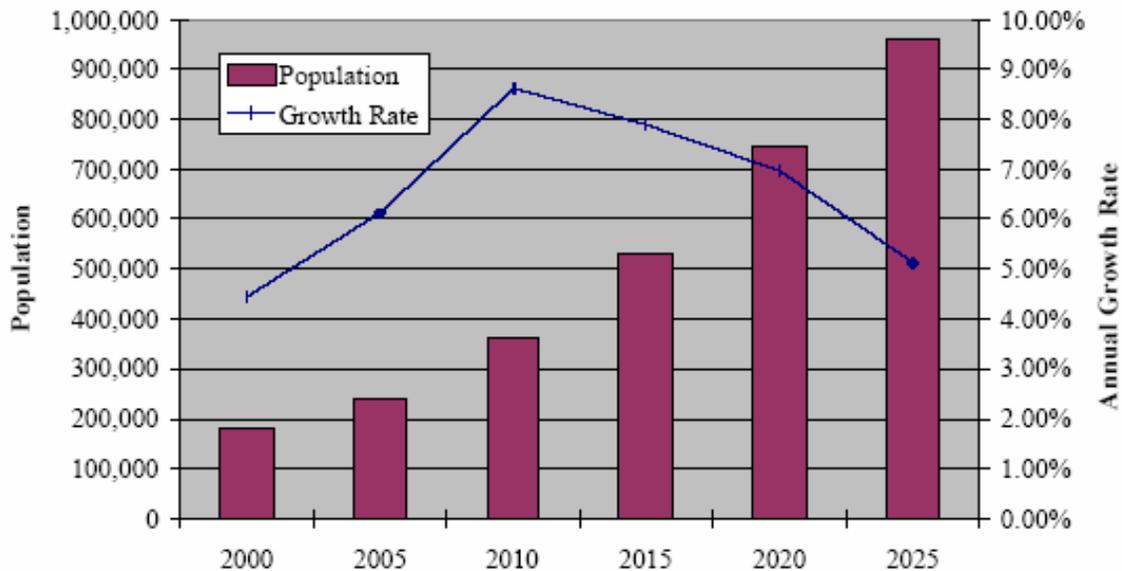
Figure 3.2 Comparison of Pinal County Population Projections, 2030



Source: Central Arizona College, 2004; Southeast Maricopa/Northern Pinal County Transportation Study, 2003; Pinal County, 2000; Apache Junction, 2003; and Cambridge Systematics, Inc., 2005.

BFS projections were available through 2025. These were extrapolated to 2030 using a continuation of the rate of growth projected in the BFS. As shown in Figure 3.3, the rate of growth is expected to moderate over time.

Figure 3.3 Projected Population Growth in Pinal County



Source: Central Arizona College Bond Feasibility Study, 2003.

For the purposes of the PCPM, BFS projections were used for each of the study areas as control totals. These estimates are the best available estimates of population growth in Pinal County. They were developed using sophisticated methods that take into account actual development plans, available developable land in the County, expected demographic changes, and other related information. These estimates were distributed to PCPM zones using the distribution of population used in the SEMNPTS and Apache Junction models and land use data from individual jurisdictions and Pinal County.

■ 3.2 Pinal County Dwelling Unit Projections

The BFS estimates total housing units to be constructed by study area. Housing units are slightly different than dwelling units, in that they do not include group quarters (prisons, dorms, etc.). For most of the study area, this is not a significant issue, especially because many group quarters, such as prisons, are not intended to be included in the population forecasts.

For the PCPM, BFS estimates of housing units were used as control totals for each study area. These totals were distributed to zones using the dwelling units identified in the Apache Junction and SEMNPTS travel demand models.

After the initial distribution was generated, these numbers were checked against the carrying capacity of individual zones. The distribution method used has the potential to

allocate more population and dwelling units to a zone than could reasonably be housed there. For the purposes of the PCPM, an upper bound of 3.5 dwelling units per acre was used as the maximum housing density. This represents the upper bound of current planning used by Pinal County for unincorporated areas, and is significantly denser than most of the development currently taking place in Pinal County. The City of Maricopa, which has been developing rapidly over the last several years, expects between 2.9 and 3.4 dwelling units per acre.

After applying the dwelling unit cap, the population for the zone was set based on the population per dwelling unit already established for that zone. The remaining population and dwelling units were then distributed to adjacent zones within the study area based on the level of development of that zone. These adjustments were applied iteratively using the dwelling unit per acre cap until no zones had above 3.5 dwelling units per acre.

■ 3.3 Pinal County Employment Projections

The BFS does not provide employment projections. Employment projections are available from existing travel demand models and, at the county level, from the proprietary Woods & Poole dataset.

The following estimation steps were applied to estimate future employment:

- Employment control total for entire study area within Pinal County;
- Employment control totals for each BFS study area;
- Employment control totals for each land use category used in the model;
- Employment by land use category for each BFS study area; and
- Employment by land use category for each PCPM zone.

Each of these steps is described in detail below.

Employment Control Total for Pinal County

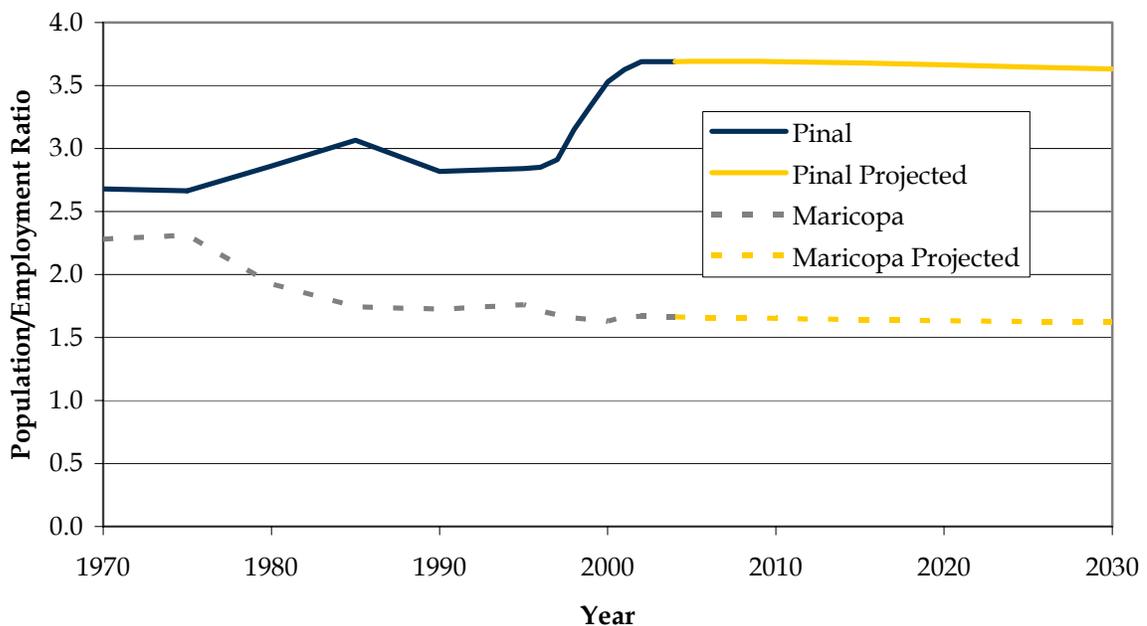
The first step was to estimate an employment control total for the entire study area within Pinal County. PCPM zones in Maricopa County were handled separately, as described below. Because of the lack of existing sophisticated employment projections for the PCPM study area, the employment control totals were estimated relative to population growth. Both the existing models and Woods & Poole data provided potential estimates of the ratio between population and employment used in this analysis.

Figure 3.4 presents historical and projected future population-employment ratios from Woods & Poole forecasts of population and employment for Pinal and Maricopa Counties.

Since the 1980s, Maricopa County has had a fairly constant ratio of about 1.6 persons per job. This reflects Phoenix’s status as the major employment center in the State. Until the late 1990s, Pinal County had held relatively constant at about 2.8 persons per job, but recent housing development has spiked the ratio to roughly 3.6 persons per job. For the future, Woods & Poole has projected population and employment to grow together in both Counties. This seems appropriate for Maricopa County, which is well established, but seems to rely heavily on more recent housing growth trends and not longer-term trends.

Because there is no definitive, well-researched estimate of even near-term employment growth in Pinal County, the PCPM will use the ratio identified in the Woods & Poole data to generate an employment control total for the overall study area. This may be a somewhat conservative forecast of employment, but reflects the best data available. The resulting total employment representing the study area and contained in the PCPM is approximately 300,000 jobs in 2030.

Figure 3.4 Population-Employment Ratio, Maricopa and Pinal Counties



Source: Woods & Poole, 2004.

Employment Control Totals by Study Area

The next step was to estimate an employment control total for each BFS study area. Each of the BFS study areas exhibit different development characteristics. The San Tan area has recently been a rapidly growing residential area with little employment. Casa Grande, by

contrast, is a more established area with a substantial employment base. Again, the SEMNPTS and Pinal County models provide some guidance on which areas are likely to have higher or lower employment totals. Table 3.1 presents the percent of total employment in each of the BFS study areas in Pinal County and an average of the two sources.

Table 3.1 Percent of Total Employment by Study Area

	BFS Study Area	Data Source		
		SEMNPTS	Pinal County	Average
1	Apache Junction	19.5%	18.3%	18.9%
2	Superior	0.7%	0.4%	0.6%
3	Maricopa-Stanfield	15.8%	7.7%	11.7%
4	Casa Grande	35.4%	31.4%	33.4%
5	Coolidge	4.3%	9.3%	6.8%
6A	San Tan	8.0%	15.8%	11.9%
6B	Florence	10.4%	14.1%	12.2%
8	Eloy	6.0%	3.0%	4.5%
Pinal County Total		100.0%	100.0%	100.0%

Source: Southeast Maricopa/Northern Pinal County Transportation Study, 2003; Pinal County, 2000; and Cambridge Systematics, Inc., 2005.

Several areas are relatively consistent between the two modeling systems, including the largest and the more established areas – Apache Junction, Casa Grande, and Florence. Superior has too little employment in either travel model to represent a substantial difference between the two. For these areas, a rough average of the two modeling systems was used to generate an initial total employment forecast for 2030.

The estimates for the Eloy study area in the SEMNPTS model are double the Pinal County model (six percent versus three percent). However, because this study area has relatively little employment compared to most of the other study areas in Pinal County, an average of the SEMNPTS and Pinal County modeling systems was used to generate an initial 2030 forecast of employment for this study area.

Coolidge also has relatively low employment estimates in both modeling systems. This area, however, has been targeted by economic development planners for future employment growth. As a result, the 2030 employment estimates for this area use the upper range of these estimates (12 percent, slightly more than identified in the Pinal County model).

The two most challenging areas for estimating reasonable employment growth are the two fastest growing ones – Maricopa-Stanfield and San Tan. In the two modeling systems,

these two study areas are the reverse of one another. The SEMNPTS model predicts roughly double the number of employees in Maricopa-Stanfield than in San Tan; the Pinal County model predicts the exact opposite. Currently, neither of these areas is a major employment center, both within a reasonable drive of employment centers in the Phoenix metropolitan area. In the BFS, both areas are expected to have roughly 250,000 residents in 2030. Given their proximity to Phoenix, it is expected that these study areas will continue to see relatively higher population-employment ratios than other parts of Pinal County. As such, future employment was estimated to the low end of the available estimates, at roughly nine percent each.

These rough approximations account for nearly 99 percent of the total employment in the PCPM modeling area. Because these estimates are necessarily imprecise, estimates were averaged upwards to generate a full 100 percent of potential expected employment. Table 3.2 presents the estimated percent and total employment, as well as the resulting population-employment ratio, for each BFS study area as defined in the PCPM.

Table 3.2 PCPM Projected Employment by Study Area

BFS Study Area		Projected Employment	Percent	Population- Employment Ratio
1	Apache Junction	57,000	19.0%	3.74
2	Superior	1,500	0.5%	3.38
3	Maricopa-Stanfield	27,000	9.0%	8.54
4	Casa Grande	102,000	34.0%	1.62
5	Coolidge	36,000	12.0%	3.14
6A	San Tan	27,000	0.0%	9.23
6B	Florence	36,000	12.0%	1.58
8	Eloy	13,500	4.5%	4.16
Pinal County Total		300,000	100.0%	3.63

Source: Cambridge Systematics, Inc., 2005.

Employment Control Totals by Land Use Category

As described above, the PCPM uses five employment categories – retail, office, general (industrial), government, and other. The third step is to estimate total employment in the study area by land use category. This provides a second set of control totals that are useful for generating employment projections by zones. This step is one of the most difficult,

because the current distributions of employment are likely to change over time as the cities in Pinal County mature.

Two primary sources are available to estimate future employment by land use category: SEMNPTS model data and Woods & Poole data. The Apache Junction model also provides projected employment by land use category, but only for one of the BFS study areas. The results from the Apache Junction model are consistent with those for the SEMNPTS model.

Although both the SEMNPTS model and Woods & Poole forecast employment by industry, each uses a different means of disaggregation. The SEMNPTS model data predicts employment by land use type (e.g., retail stores, office buildings, etc.). The Woods & Poole data predict employment by industry, but the industries do not always correspond neatly to land uses. For example, the headquarters of a manufacturing establishment would be categorized as manufacturing and not an office use. As such, comparisons have to be made carefully. Table 3.3 presents the SEMNPTS model distribution of employment by land use category for 2004 and 2030.

Table 3.3 Employment Estimates, 2004 and 2030

Employment Category	Percent of Employment	
	2004	2030
Retail	21%	16%
Office	10%	7%
General	28%	45%
Government	14%	13%
Other	26%	18%
Total	100%	100%

Source: Southeast Maricopa/Northern Pinal County Transportation Study, 2003.

Retail

The SEMNPTS model predicts that retail’s share of employment will decline between 2004 and 2030. Woods & Poole predicts retail employment to decline only slightly between 2004 and 2030. Retail employment is largely dependent on population. As a result, the PCPM expects retail employment to hold steady in the future, at roughly 20 percent.

Office

The SEMNPTS model predicts office's share of employment to decline between 2004 and 2030. Given the changing nature of Pinal County from an agricultural and extractive economy to a more industrial and office-based economy, this seems inappropriate. Woods & Poole predicts that professional employment (finance, insurance, real estate, and services) will be the fastest growing category of employment between 2004 and 2030. These types of employment are expected to grow 90 percent between 2004 and 2030, compared to 65 percent for all types of employment. As a result, office's total share of employment in the PCPM is expected to grow to 15 percent.

General

General employment includes a wide variety of employment types, including agriculture, manufacturing, warehousing, and others. Pinal County is focusing economic development efforts on light industrial, warehousing, and other similar industries. These industries also frequently develop on the periphery of major urban areas, such as Phoenix. At the same time, extractive industries are expected to decline over this time as farms are replaced by homes and industrial buildings. As a whole, Woods & Poole predicts that this category will grow by roughly 35 percent between 2004 and 2030, much slower than the rate predicted in the SEMNPTS model. Because many of these industries are being targeted for growth by economic development planners in Pinal County, the total employment in this category is expected to grow faster than predicted by Woods & Poole, but somewhat less than predicted by SEMNPTS. General employment is projected at 34 percent of total employment for the PCPM in 2030.

Government

Government employment should be fairly consistent, as is shown in the data derived from the SEMNPTS model. The SEMNPTS distribution to government for 2030 (13 percent) was used to estimate a control total for government employment for the PCPM in 2030.

Other

Other employment is a catch-all category for types of employment that may not be clearly represented in the other land use categories. It also includes facilities such as hospitals, churches, and other similar facilities. Woods & Poole provides no information to estimate employment in these land uses. As a result, the SEMNPTS' percent of employment for 2030 (18 percent) was used for the PCPM. Final employment projections by category and the resulting population-employment ratios are provided in Table 3.4.

Table 3.4 PCPM Employment by Land Use Category

Category	Projected Employment	Percent	Population- Employment Ratio
Retail	60,000	20%	18.17
Office	45,000	15%	24.22
General	102,000	34%	10.69
Government	39,000	13%	27.95
Other	54,000	18%	20.18
Total	300,000	100%	3.63

Source: Cambridge Systematics, Inc., 2005.

Employment by Land Use Category and Study Area

The next step combines the previous two steps to develop employment estimates by land use category and study area. Two methods were used to develop initial estimates:

1. **Expected Value.** The control totals for employment by land use category and by study area were used to generate the expected value for each combination (e.g., Apache Junction retail employment), assuming that the distribution of employment by category was the same for each study area. This generates an initial table of values that is consistent with the control totals generated above.
2. **SEMNPPTS Model.** The distribution of employment by land use category from the SEMNPPTS model was applied to study area control totals to develop total employment by land use category and study area. This generates a second table of values that better represents local conditions in each study area.

The cells of the two tables generated using these methods were averaged to generate a starting distribution of employment by land use category and study area. The totals by study area and land use category were compared to the control totals generated above and minor adjustments were made to ensure that these values were consistent with those control totals. A total of under 15,000 jobs were shifted between employment categories to maintain consistency with the control totals. These adjustments were made based on the observed distribution in the table. Table 3.5 presents the final distribution of employment by study area and land use category.

Table 3.5 Employment by Land Use Category and Study Area

BFS Study Area	Retail	Office	General	Govern- ment	Other	Total
1 Apache Junction	14,755	9,155	14,200	6,960	11,930	57,000
2 Superior	255	132	660	178	275	1,500
3 Maricopa-Stanfield	4,605	3,960	11,820	2,300	4,315	27,000
4 Casa Grande	19,215	16,095	38,260	15,570	12,860	102,000
5 Coolidge	7,675	5,430	10,710	5,345	6,840	36,000
6A San Tan	4,945	3,850	7,370	2,460	8,375	27,000
6B Florence	5,920	4,030	14,625	4,455	6,970	36,000
8 Eloy	2,630	2,348	4,355	1,732	2,435	13,500
Pinal County Total	60,000	45,000	102,000	39,000	54,000	300,000

Source: Cambridge Systematics, Inc., 2005.

Employment by PCPM Zone

The final step is to estimate employment by land use category for each of the zones in the PCPM. The distribution from study areas to zones was made using the SEMNPTS model distribution of employment by zone, retaining the final control totals established in Table 3.8.

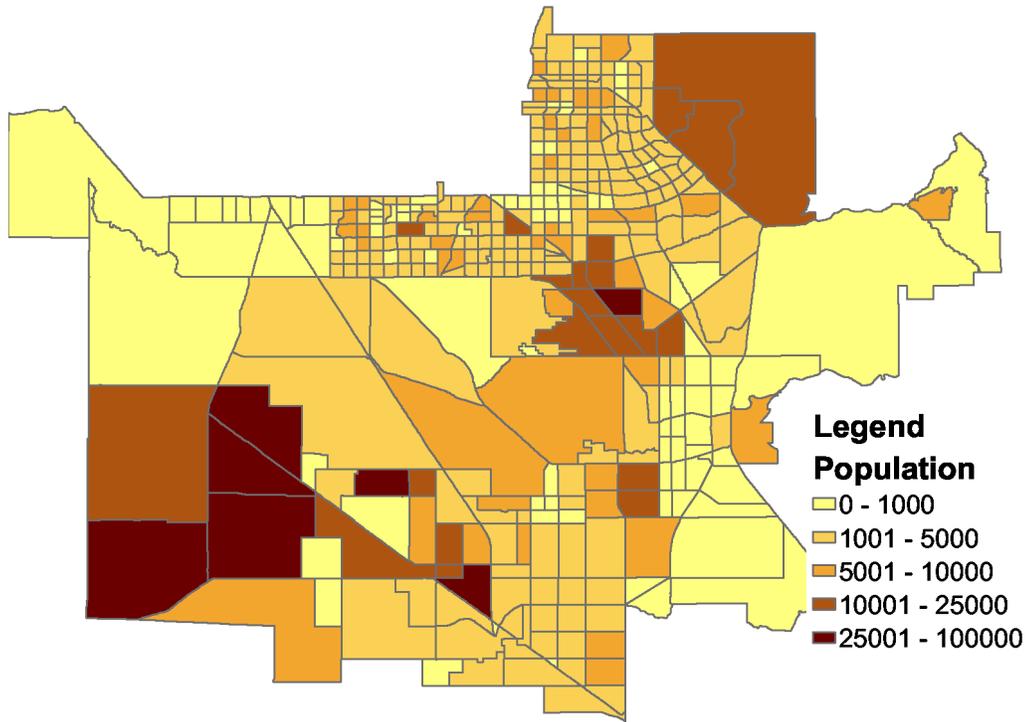
■ **3.4 Maricopa County – Population and Employment**

Three of the BFS study areas are within Maricopa County – Mesa, Gilbert-Queen Creek, and Chandler. The BFS used data from the MAG model to develop population forecasts for these three study areas. As the MAG model provides the only data available for these areas, the PCPM used MAG model data for both population and employment projections for zones in these study areas.

■ **3.5 Summary of Future Year (2030) Projections**

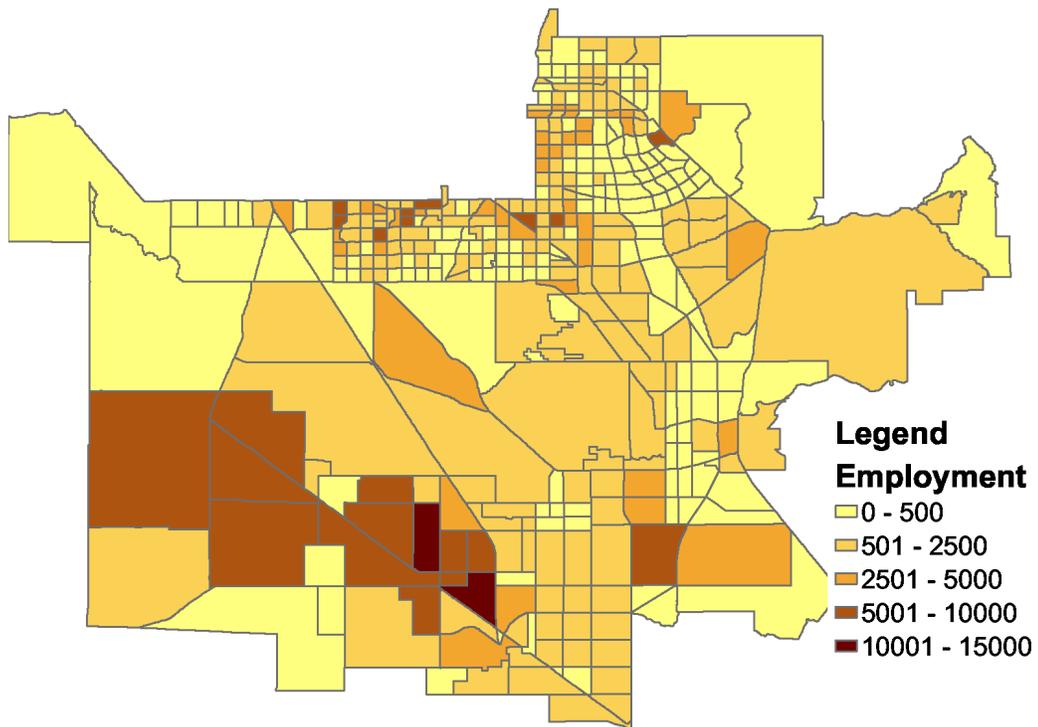
Final population projections for 2030 are shown in Figure 3.5, and final total employment projections are shown in Figure 3.6. Tables with zonal-level estimates of population and employment are attached in Appendix B.

Figure 3.5 PCPM 2030 Population Projections by Zone



Source: Cambridge Systematics, Inc.

Figure 3.6 PCPM 2030 Employment Projections by Zone



Source: Cambridge Systematics, Inc., 2005.